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MILITARY AFFAIRS

No. 1687

Aviatsiya I Kosmonavtika

No.3, March 1982

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7 July 1982

USSR REPORT
MILITARY AFFAIRS

No. 1687

AVIATSIYA I KOSMONAVTIKA

No. 3, March 1982

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Inside back--8 March: International women's day. Photographs by A. Kurbatov, D. Petryayev and A. Drozdov.

Outside back--Figure drawn by artist I. Kashichkin accompanying S. Bytko's article "Evaluating Pilot Errors."

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AIR FORCES

FLIGHT TRAINING: IMPROVING AIR CONTROL DISCUSSED

Moscow AVIATSIYA I KOSMONAVTIKA in Russian No 3, Mar 82 pp 1-3

[Article by Hero of the Soviet Union Col Gen Avn S. Golubev, USSR distinguished military pilot: "Improving the Flight Control System"]

[Text] Together with the Soviet people and as with all soldiers of the army and navy, the personnel of the air force are laboring persistently to implement the great plans spelled out by the 26th CPSU Congress for our society's socioeconomic development. In his speech at the November (1981) Plenum of the CPSU Central Committee, CPSU Central Committee General Secretary Comrade L. I. Brezhnev noted that the Soviet people have started the new five-year plan with a sense of optimism, with confidence in their strengths. Industry and agriculture will develop dynamically. Steps are being taken to concentrate capital investments. A new major step forward is being made in development of Siberia and the Far East. The economy of each union republic will enjoy further development. The needs of defense are being provided for reliably. Our people are deeply convinced that the great and complex tasks of communist development posed by the congress will be completed successfully.

At the same time Comrade L. I. Brezhnev focused his attention on some fundamental problems which require immediate solution. They include that of improving control of the economy and the economic mechanism, all organs of which are called upon to promote better work at enterprises and associations. He noted: "Unfortunately the style of business activity and economic thinking, the planning methods and the control system are not being reorganized with sufficient energy." Improvements in the control system do not require major outlays, and yet the impact from such improvement is highly tangible. "It follows from this that we must hasten reorganization of the style and methods of business management," emphasized Leonid Il'ich.

This has a direct bearing on the combat training activities of air units and subunits. Flying makes up the main part of airman combat training. High quality flying requires safety, and it would be unimaginable without well conceived organization and comprehensive support, without clear, reliable and continuous control. Experience shows that many errors and near-accidents occur in the air because of unsatisfactory organization of flying, mistakes in its management and poor control of aircraft movement in the air. The causes of such mistakes lie in both objective and subjective factors.

The commander organizes and directs combat and political training in the unit. He manages all of the activities of his subordinates personally, by way of his

staff and political organ. His official duties compel him to penetrate deeply into a broad range of issues, to fly, to manage the flying and to teach subunit commanders and staff officers how to conduct combat training correctly. A commander must be extremely competent if he is to handle this large load and still complete all of his tasks, including those of organizing the flying, with high quality.

In terms of its structure and dynamics, flying is a highly complex process involving the interaction of many closely associated components. And if just one element of this finely tuned mechanism fails for even a short time, no matter what the cause, a threat to fulfillment of the flying assignments and even flight safety immediately arises. Such failure is especially dangerous when it occurs in the air traffic management and control system. Flight practice has shown that it is sometimes much more difficult to manage flying in the vicinity of an airfield and practice range than to control the combat activities of a separate tactical group. All the more so if, for example, fighters and fighter bombers from the same airfield must perform the same mission together. In such cases the load on the flight leader may reach the limit, as a result of which omissions, errors and incorrect actions may be possible. Statistics show that when 10-15 airplanes are in the air simultaneously, the flight leader must spend from 38 to 57 minutes per hour just in radio communication alone. Without a doubt, no matter how well a commander is trained as a flight leader, in such a situation he would not be in a position to penetrate deeply into the problems associated with flight organization and support during a flight shift, or adequately complete tasks associated with improving the professional skills of the airmen. This also pertains in equal extent to officers permitted to act as flight leaders. Thus the need arises for clear division of labor, for strict distribution of responsibilities among members of the control group.

Research, theoretical calculations and experiments have shown that in the vicinity of an airfield, the flight control system distinctly breaks down into a landing zone, a near zone and a far zone, in which aircraft traffic follows unique laws. This means that in order to ensure efficient control of the crews flying in each of these zones, specialists must be given strictly defined functions.

The airplane traffic is the busiest in the near zone. Airplanes leave from this zone on their assignments, and they return here for their landing approach; the flying altitude profile is variable as a rule, and the crews use different radio communication channels. This is also the zone in which flying is practiced and in which group flights and flights with hooded canopies are performed. It is precisely in this zone that the rules of flying are violated most often.

Air traffic control is also complicated in the vicinity of the airfield by the fact that it is in this same zone that the radar landing leader must control the crews as they descend on their glide path. He simultaneously receives information on the airplanes from the flight leader and the command post, and to make matters worse he must monitor the work of the dispatch radar operator, who has neither flying experience nor command privileges. Conversations breaking into his channel and his occasional need to perform atypical responsibilities associated with observing airplanes in the vicinity of the airfield often distract the landing controller from his main task--controlling the crews on their glide path, especially in adverse weather. All of this has made it necessary to transfer the functions of controlling crews in the vicinity of the airfield, within a preset radius,

to a near zone flight leader, such that the landing leader would be responsible only for a particular sector of the landing radar. After the near zone leader transfers a crew to him, he can immediately assume control over it and guide it to the landing strip, since he is not distracted by any other concerns.

The far zone is the space around the airfield directly bordering on the near zone. Here the crews are under the observation of the far zone flight leader--one of the combat control officers.

Control is transferred in approximately the following pattern. The flight leader commands the crew to start engines, taxi and take off in accordance with the planning table. After the airplane takes off, the near zone flight leader assumes control, guiding the crew to its prescribed area according to the established schedule. At this area's boundary he transfers the crew to the far zone flight leader. He terminates communication with the crew only after he is absolutely sure that the airplane is being monitored dependably. The main thing here is to maintain stable communication, keep the situation under meticulous radar control and efficiently transfer control. The reliability of control depends on this, as experience shows.

After the crew completes its assignment, control is transferred in the reverse order: The combat control officer communicates data on the airplane to the near zone flight leader, who guides the crew to the landing course and transfers it to the landing zone flight leader.

As we can see, some of the functions of the flight leader and the radar landing leader have been transferred to the near zone flight leader. Thus each leader in the flight control group has his own, strictly determined duties and spheres of activity for which he bears full responsibility.

In turn the flight shift leader handles the administrative and dispatch functions which unfortunately had to be performed before by the flight leader. Now the flight shift leader can monitor and coordinate the work of the control group, better evaluate the state of the airfield and the equipment, flight support and the weather and ornithological situation, and when necessary he can assume control at any moment and in any zone to provide assistance to crews finding themselves in an emergency situation. It stands to reason that the flight shift leader, and all the more so the commander, have more time to analyze the progress in fulfilling the flight planning table, to collect information on the proficiency of the pilots, to organize the work of all support subunits brought into action during the flight shift and to solve other problems that may arise during the flying.

Without a doubt proper location of the control group members also promotes efficient control of flying. The best effect is achieved when the leaders are in the same room, sitting side by side but each possessing his own communication and control resources. As a result when control of a crew is transferred--that is, when control is transferred from one display to the next, there is no need for the officers to communicate with one another over a loudspeaker system; they can back each other up visually, making sure that the right airplane is being picked up. The flight leader, meanwhile, has a possibility for observing all radar resources and listening to all communication channels.

This system of controlling and managing the flying in the vicinity of an airfield has persuasively demonstrated its advantages. Research conducted on the flight control system reveals that the number of errors and near-accidents was reduced to a minimum, and any deviations that did occur fell in the initial period when the flight control group officers were assimilating their functional responsibilities.

Thus once Captain A. Tsoy, the near zone flight leader, evaluated the aerial situation incorrectly during the time a crew was approaching for a landing. Turning to the landing course in response to his instructions, the airplane approached another that was landing off of a straight approach. The flight leader intervened in time and averted a collision. This is an example of one very important rule: Any member of a flight control group can make mistakes (there is no guarantee against this), but the whole control group can never make a mistake.

As the flight management and control system improved, it became clear that its dependability could and should be constantly increased. It is very important to meticulously select officers capable of orienting themselves quickly and correctly in a complex aerial situation, and to account for their personal qualities and their work experience. Indifferent, slow-acting and inexperienced officers must not be permitted to act as flight leaders.

Practice shows that experienced landing leaders as well as combat control officers with a sufficient career behind them can learn the functions of a near zone flight leader relatively quickly. Incidentally young specialists certified to control crews in the landing zone and admitted to a flight control group containing experienced leaders also perform their duties successfully following a certain period of apprenticeship. The landing zone flight leader need not maintain surveillance over the entire near zone. He monitors only the narrow sector of airspace for which he is responsible.

It should be noted for the sake of justice that in the initial period of assimilating their functional responsibilities, the leaders did make typical errors in their zones associated with psychological retuning. For example flight leaders did not leave the near zone leaders alone enough, often interfering in their activities without grounds, forgetting about their own immediate functions. This is fully explainable: They have developed a habit which is hard to get rid of right away, that of personally controlling air traffic at the airfield and in the space adjacent to it. Another tendency was noted as well: Flight leaders sometimes became too relaxed, they trusted too greatly in the near zone leaders, and they reduced their alertness, as a result of which complications in the air sometimes caught them napping.

Improvements in the flight management and control system made it possible to clearly determine the place and responsibilities of each leader. Flight safety increased. This is quite a lot, if we consider that every flying accident or near-accident does a certain degree of harm. In this case while the material losses can be expressed in concrete figures, the moral harm cannot be calculated in any way, and sometimes it has a negative influence on the psychological state of the personnel for a relatively long time.

Constant purposeful improvements in the flight control and management system and further improvement of flight safety are important tasks and a party duty of commanders and staff officers, of political workers and of all communists. We must always remember--the 26th CPSU Congress turned its attention to this--that "...improvements in the organizational structures of control cannot endure sluggishness. A living, developing organism of economic control cannot be adapted to obsolete, accustomed forms. On the contrary the forms must be brought in correspondence with the changing economic tasks."

The quality of flight shift planning also has a great influence on the efficiency and reliability of control. Practice has shown that omissions and ambiguities in the planning table are always at the root of complexities that may arise. The flight planning table is an object of special concern of commanders and staff. Planning is something that must be learned, constantly and persistently. Flight control group members who will be working a given flight shift must also participate in the planning. It stands to reason that careful rehearsal of the control group at its work stations using the planning table for the forthcoming flights is a prerequisite of dependable control and flight safety.

There still are unutilized reserves in the flight safety support system, and if commanders, staffs, political organs and active party and Komsomol members display constant concern for raising the quality of combat and political training and if they react to all requirements dictated by experience, the work proceeds in a smooth rhythm, without stops and starts. Organization, efficiency and discipline on the part of both the executives and the executors play the decisive role in this case, especially in flying.

Improvement of the organization of flight preparation and performance of flying without accidents and near-accidents are indispensable prerequisites of high combat readiness and an issue of state importance. And as Comrade L. I. Brezhnev said at the November (1981) Plenum of the CPSU Central Committee, "every communist must...devote all of his strength, experience and knowledge to seeking out the reserves in his area and to raising the effectiveness of labor, every communist must be a worthy example of selfless labor."

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AIR FORCES

TECHNICAL SERVICES: PROBLEMS IN MAINTENANCE DISCUSSED

Moscow AVIATSIYA I KOSMONAVTIKA in Russian No 3, Mar 82 pp 4-5

[Article by Maj Gen Avn F. Fomichev: "If Industriousness is Low"]

[Text] Having completed his exercise in the practice zone, Major L. Sorokin continued to fly with a hooded canopy. On approaching the airfield he reported to the flight leader by radio and began preparing for the maneuver that would line him up with the airfield. He guided the aircraft precisely onto the glide path on instruments, and then adjusted his engines accordingly. He passed the long-range homing station, and the near marker beacon sounded. The airplane approached the landing strip. But the hood remained on. Why was the instructor taking his time? Finally the hood was cast back, and the edge of the landing strip appeared directly in front of him. His altitude was still high.

"We'll land," he heard the voice of his instructor, Major G. Arzhayev.

The airplane dropped a considerable distance from level flight, its wheels struck the concrete hard, and the airplane responded with an upward lunge. There could be no thought of a normal landing. The flight leader commanded him with a sense of urgency:

"Go around for a second pass!"

Sorokin increased his engine RPM, and the airplane gradually began gaining altitude.

Squadron commander Major G. Arzhayev and his deputy, Major L. Sorokin are top-class pilots, experienced executive officers, competent organizers of combat and political training and good instructors. The mistake they made while landing aroused amazement.

This incident was thoroughly critiqued and analyzed. As it turned out, at the moment they passed the near radio beacon the instructor tried to lift the hood, but something was wrong: Its release mechanism was jammed. He did finally manage to pull the hood back, but the altitude no longer permitted a normal landing. Nevertheless the decision to land was made. And as we can see, the result was not very good. The instructor should have checked the work of the hood opening and closing mechanism before taking off. But he did not do so. In turn, the pilot undergoing his check-out should not have waited so long; he should have told the instructor that the hood had not lifted, thus making the situation more complex.

This incident was not bad luck: It was the result of a failure to comply with the flight regulations and of poor control over the flight crew's preparations for flying by the flight executive. Thus during their preflight preparations the crew did not completely analyze the assignment in stages or the order and sequence of its execution, and it did not adequately practice the manipulations of the cockpit fittings or the actions to be taken in unusual situations. As is required by the regulations, the senior chiefs should have checked the quality of the flight preparations, revealed the shortcomings and prevented the near-accident. Poor control and the negative results were obvious.

As we know, complacency generated by satisfaction with achieved successes inevitably causes a weakening of efficient and thorough control, a decrease in exactingness and, as a consequence, a drop in industriousness. An atmosphere of indifference begins to develop in the collective--that is, the problem makes itself known full circle. How can this circle be broken? I think that the solution should be sought in efficient and well conceived planning of combat and political training and in rigid control over fulfillment of orders, instructions and plans by commanders, political workers and party organizations.

I deliberately brought up an example from a unit in which serious attention is devoted to organization, industriousness and discipline, and in which the aerial skills of the pilots, the professional training of engineers and technicians and the combat readiness of the subunit are all at a high level. The command reacted quickly to the incident, and it took decisive steps to prevent similar cases. In particular, special attention was devoted to raising the effectiveness of control.

It should be noted that some commanders and staff officers have an incorrect idea of what control is. Attempting to penetrate into each little detail and coaching their subordinates in every way possible, they do not allow them even the slightest possibility of displaying initiative. Such control can only do harm. It subdues and sometimes completely suppresses the executive officer's will and sense of personal responsibility, and it gives birth to and develops weakness of character. As a result a commander nurtured in this spirit no longer dares to make any decisions on his own, without watching for the approval of a higher supervisor. It would not be difficult to imagine him in a combat situation: He would probably find himself helpless and would not be able to perform his mission. Therefore when exercising control, we must consider the main indicators: The aerial proficiency and political maturity of the airmen, the state of combat readiness and the state of flight safety in the subunits.

Airmen demonstrated high organization and greater fire and tactical proficiency in exercise "Zapad-81." But these successes should not overshadow the unsolved problems. The quality of combat training can be maintained at a high level only when professional skills are constantly improved. And one of the prerequisites of this is industriousness and organization, based on the high responsibility of each airman for his work, and a deep awareness of duty to the party, motherland and the Soviet people. To nurture these qualities, commanders and political workers must work hard every day, they must penetrate deeply into the affairs and thoughts of their subordinates, they must show concern for their needs, and they should render the required assistance.

The air units and subunits are now undergoing intense combat training. Soldiers participating in a socialist competition proceeding under the slogan "Reliable protection for the peaceful labor of the Soviet people!" are fighting for high effectiveness and quality of professional skills and for greater safety and combat readiness. Without a doubt, growth in the indicators of all forms of combat and political training and the contribution made by each airman and air subunit to the common cause are very important reference points along this path. And though I may be accused of being repetitive, I would say that the highest degree of organization, discipline and industriousness in all elements of the complex aviation organism deserves no less attention.

Military wisdom has reason for calling industriousness the soul of military service, since without it, the existence of an army would be simply unimaginable. It is based on unshakeable communist conviction permeated by a deep awareness of the need for unquestioning obedience. Taking their military oath, soldiers vow to fulfill all army laws and orders of commanders and chiefs to the best of their ability. This means that industriousness, which organically includes a constant readiness to complete a task, organization and self-control, is the foundation for assimilation of the knowledge the soldier needs and for mastery of modern weapons and combat equipment. In other words industriousness personifies all without which a soldier's activity would be unimaginable, in both peacetime and wartime.

When commanders, staff officers and political workers draw up their combat and political training plans, they do so with the belief that all of the tasks would be completed successfully owing to firm discipline, high industriousness and well organized control. But many various problems requiring immediate solution arise in the course of daily life and in combat training. In this connection we often hear commanders complaining that the paperwork takes up too much time, sometimes getting in the way of what is most important. But experience shows that such cases arise when the planning of combat and political training is not based on thoughtful analysis. As a result scheduling conflicts occur, and industriousness suffers. This also happens because of an inability to draw up realistic, purposeful plans. This is something that must be constantly learned and constantly taught.

In the final analysis, executive discipline means more than just fulfilling the requirements of the training plan accurately and on schedule. It is no less important to know how to achieve the highest quality of execution. And this requires a decisive effort to raise the productivity of each minute of training time, an effort to see that the airmen are assimilating their study subjects completely.

Calm, efficient, rhythmical work distinguishes the air collective led by Officer V. Vasil'yev. The commander's high industriousness in combat and political training, his organizational capabilities and his ability to maintain control mobilize the airmen to constantly improve their work and command qualities. V. Vasil'yev devotes special attention to developing firm leadership habits in his subordinates. Organizing control over plan fulfillment, he focuses special attention on the shortcomings. But he does more than just place them in the spotlight: He literally analyzes them, digging down to the roots of their causes.

Properly organized work conferences, critiques and general meetings promote methodologically competent development of a thrifty attitude toward working time

in the airmen. It should be pointed out that speakers at meetings organized in this manner keep their words to the point. This creates an atmosphere of efficiency, improves the content of such functions and raises their effectiveness. Also deserving of full support is the fact that Vasil'yev's officers are not afraid of speaking openly about the shortcomings in their collectives. This in my opinion is a major achievement, since unhibited admission of the causes of failures in organization and in combat training is primarily a sign of a critical attitude toward the work done, a sign of high exactingness and competency on the part of the persons responsible for controlling plan execution.

The best examples of discipline should doubtlessly be used as the basis for nurturing airmen in the spirit of unfailing fulfillment of the requirements of flight laws and rules, but this does not mean that shortcomings and cases of low industriousness and an unconscientious attitude toward service should be avoided. Only a pilot who is deeply aware of his personal responsibility for maintaining high combat readiness, one who can critically evaluate and analyze his work and that of his subordinates, can reach the summits of occupational proficiency, display real bravery in combat and honorably justify his high appointment as a defender of the motherland's airspace.

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AIR FORCES

FIGHTERS: TACTICAL GROUND ATTACK TRAINING DISCUSSED

Moscow AVIATSIYA I KOSMONAVTIKA in Russian No 3, Mar 82 p 10

[Article by Engr-Lt Col V. Karyakin, candidate of military sciences: "Predicting a Situation in Combat"]

[Text] As the subunits in the assault echelon of the advancing troops approached the river's edge, intelligence reported that "enemy" reserves were approaching. They had to be halted before they reached the lines of defense. This mission fell upon the airmen.

The chief of staff of the air regiment pointed to a spot on the map. Here, deep in the "enemy's" defenses, Major N. Sergeyev's squadron had to attack an important transportation junction. The squadron commander bent over the map. Beside the river's right bank stretched a range of hills, and along it, a marshy valley offering poor accessibility to equipment. There were the radar posts, and a fighter airfield. The rough terrain would make it possible to approach the target without being detected by "enemy" radar. The situation was clear, but what was the best way to distribute the forces, and how was the strike to be prepared? There were some things to think about here.... "The marshy river valley will prevent the 'enemy' from using antiaircraft resources there," Major Sergeyev thought. "One group will follow this route.... We'll select the flying altitude after running the data through the computer."

The calculation results showed that there were radar shadows above the river valley, beyond the reach of "enemy" radar. One other approach to the object of the attack was discovered--through a ravine cutting the hills. It would make the appearance of the airplanes over the target a surprise. This was the route the second group of airplanes was to take. And the third will take on the airfield. This was what Major Sergeyev decided.

The command to take off was soon issued. The first to take to the air was Captain V. Fedorenko's group. The rest of the crews left on their missions strictly according to the timetable.

The commander's calculations turned out to be accurate. As Major Sergeyev foresaw, the operators at the ground radar stations were unable to detect the attacking airplanes until the last moment. Unexpectedly diving from out of the hills, the attack group swiftly attacked an accumulation of "enemy" reserves. The "enemy's"

fighters could do nothing to help the subunits, because Captain Fedorenko's flight was dependably blocking the airfield. The target was annihilated.

Evaluating the actions of the squadron commander, the regiment chief of staff noted that the pilots were successful owing to Major Sergeyev's high tactical preparedness and his ability to execute his missions creatively. He competently analyzed the situation, evaluated the "enemy's" capabilities, revealed the weakest points of his defenses, correctly organized the maneuvers and managed to predict the events.

The art of prediction has always played an important role in military affairs. Every commander, making a decision for combat, tries to predict the possible move the enemy will make, the general development of events and the concrete conditions under which the mission would have to be performed, and it is on this basis that he develops his plan of combat.

The experience of the Great Patriotic War shows that prediction based on scientific methods of evaluating a situation is precisely what made it possible to beat the enemy. It allowed the commander to promptly determine the goal of action and the means of its achievement, to properly dispose his men and equipment, to concentrate them in the main sectors, to develop the order of their commitment to combat, to control them dependably and to win the engagement with the least losses.

Today, now that the power of weapons and the scope and fluidity of troop combat activities have expanded their borders significantly, the role of prediction has grown even more. Owing to development of military theory the methods of evaluating and predicting the situation on the battlefield underwent qualitative change in the postwar years. Before, for example, prediction was purely empirical in nature, based mainly on the personal experience the air commander acquired in combat. He used this experience in predicting events by comparing the situation at hand with a similar one encountered earlier. The commander's combat experience was one of the principal factors of success in combat.

Today the empirical methods of prediction are not enough to the commander. Scientific predictions based on a knowledge of Marxist-Leninist methodology and the laws of war, coupled with the use of the latest equipment, employment of modern mathematical methods and simulation of the dynamics of combat with a computer, is now acquiring decisive significance.

Modern automation makes it possible to collect extensive information on the situation in the area of combat activities, to display it visually and to analyze it deeply. Computers, calculation methods and models help the commander and staff promptly complete the calculations required for prediction of a situation. But a computer can be a dependable assistant only to a commander who is an outstanding tactician, who possesses deep and comprehensive knowledge of the equipment and armament, who is able to critically analyze the information, and who can evaluate a situation creatively. Without a doubt these qualities do not appear spontaneously; they are nurtured through intense combat training.

The greatest success in combat training is achieved wherever tactics is treated as one of the main problems of training and indoctrination, in addition to

developing high moral, combat and psychological qualities in the air warriors. As an example the unit in which Major N. Sergeyev serves constantly seeks effective, up-to-date forms and methods of training the personnel and staff officers, and it uses the training base and trainers with a maximum payoff. Group exercises and short tactical exercises are conducted in a creative effort to arrive at optimum training concepts. The commander and the staff officers try to see that each lesson is conducted without simplification, dynamically and instructively. When they make preparations for a forthcoming exercise, they play out its principal phases using estimates of the combat capabilities of the sides. Lesson and exercise leaders think out the situation and different contingencies beforehand. This makes it possible for them to introduce complex scenario inputs into the training lessons, which in turn forces the commanders to quickly analyze changes in the situation, to predict the further course of events and to make concrete decisions. This method of training develops the tactical thinking of the officers and gets them used to combining intuition with precise calculations. Knowledge and habits acquired in such lessons are polished in the air.

As we know, it is precisely in exercises that we acquire experience in using computers and models to analyze and predict events. The more complex the situation, the more tangible the benefit enjoyed by the commander. Frequent participation in such functions promotes development of the airmen's habits of quickly estimating a situation and correctly predicting the dynamics of its development. With time, the commander gains experience and the ability to use automation resources most effectively. He develops intuition which permits him to quickly make good estimates of an evolving combat situation and predict the course of events on the basis of precise calculations and experience.

But predicting the course of events is only a prelude to victory in combat. We must also learn to control men and equipment confidently and decisively in all phases of combat activity. A commander's uncertainty is quickly noticed by subordinates, and this has a negative effect on their work. A commander who is confident in himself and in his collective will be successful.

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AIR FORCES

FIGHTERS: INTERCEPTOR TACTICAL TRAINING DISCUSSED

Moscow AVIATSIYA I KOSMONAVTIKA in Russian No 3, Mar 82 pp 26-27

[Article by Maj L. Isakov: "Contrails"]

[Text] The airfield has been living at a fast pace since the first days of the new training year. The fighter pilots are persistently improving their occupational proficiency in the practice zone, participating in interception missions and aerial combat. They are fighting a heated battle for victory in the socialist competition.

One after the other, the airplanes taxied to the central fueling station. Talking eagerly with each other, the pilots walked to the tower for the critique of their assignment, and to rest and refresh themselves for successful completion of the next combat training mission. Meanwhile the technicians and mechanics prepared the missile carriers for their next sorties.

Flight commander Military Pilot 1st Class Captain V. Serpov stepped unhurriedly across the parking pad from his airplane, as one who had just finished doing something hard. And even a quick look at the officer would be enough to conclude that his mind was still out there, in the sky, where the contrails created by the engine of his fighter still lingered.

This relaxed pace had its reason for existence: Captain Vladimir Serpov was by nature an analyst. The officer does not evaluate his actions in the sky on the basis of whether they were successful or not; instead, he necessarily considers all levels of success in each flight.

He had intercepted the "enemy" at the required point and shot him down with the first attack, but Serpov could not help thinking how he might have acted, had his rival created interference or performed an energetic countermaneuver. The officer also thought about whether or not he could have "squeezed" a little more out of his obedient fighter, so that the "enemy" would not have had even the slightest possibility of avoiding his blow. Or should he not try out, in his next flight, the intercept model for which he had developed the theory?

Immersed in thought, the flight commander walked to the tower. Here, new concerns awaited him. Looking over the planning table, he spoke briefly with the pilots of his flight. How are things going with their subordinates? What progress had they made in this shift in completing the monthly plans? Everything was as it should be. There was nothing special troubling the commander. This meant that the achievements had to be consolidated, and that the subordinate training procedures were valid.

But this had not always been the case. The fighting collective also contains young pilots just beginning to deploy their wings. They all graduated from the same school, but the piloting signature of each was different. It was not always very neat, moreover. Much more work still had to be done with their "penmanship". After all, the strength of a flight lies in its cohesion, in the coordination of its actions, such that each pilot could stand in for another in the air, and a follower always understands a leader intuitively. These qualities are achieved through individual work with subordinates.

The subunit commander devotes much time and effort to training Senior Lieutenant G. Korbut. This officer is a pilot 2d class. He is preparing for the examinations for 1st class. He was making progress, but failures also sometimes occurred. Once on an intercept mission at night in the clouds, Korbut suddenly halted his attack and did not finish it. He failed his assignment.

The flight commander thoroughly analyzed the actions of his subordinate. He found the reason for the mistake: The pilot temporarily fell victim to the power of an insidious enemy--illusion. He did not correctly adjust the cockpit lighting before beginning work with his sight.

Communist Officer Serpov took steps to prevent repetition of such a mistake, one which can threaten flight safety. The commander went over the theoretical questions thoroughly with Korbut, and then he subjected him to a few additional night training exercises. Things did not change for the better right away. But there came a time when Senior Lieutenant Korbut completed a night intercept mission with outstanding results.

This is always the case. If one of the pilots makes a mistake, if a certain exercise becomes a stumbling block, the flight commander immediately determines what went wrong: Either the cause lay in the professional or personal qualities of the officer, or Serpov himself had failed to do his job completely somehow. And once again the thinking and the searching.... Sometimes a temporary retreat is even required, back to square one. Sometimes you even have to teach pilots things such as how to approach an airplane and sit down in the cockpit. After all, a flight begins not when the fighter takes off, but much sooner. And if the flight begins in the pilot's consciousness back at the moment when the air warriors synchronize their watches in the preflight briefing, there would be full grounds for assuming that the flight would be successful.

Communist Officer Serpov learned the methods of training and indoctrinating subordinates while serving in a squadron of master combat pilots. He absorbed much from experienced teachers of young pilots, for example from Lieutenant Colonel V. Vorob'yev, a military pilot-sniper. And now the captain is persistently improving his skills and keeping a watchful eye on what his chiefs and contemporaries are doing. He invariably adapts their best ideas to his own needs, and he studies the special literature to learn the fine points of military pedagogics and psychology. This all produces good results.

Once Vladimir Serpov noted that a young pilot was a little anxious as he took his place in the two-seat cockpit. There was still time before take-off. The flight commander climbed up the ladder and took the officer's hand. His pulse was fast.

"Are you nervous?" the captain asked.

"Yes," the lieutenant admitted.

"Try to relax. You've prepared well for the flight. Go through it in your mind once more. And remember: We worked out the exercise in detail on the ground."

His recommendation helped.

"To be sure, a person cannot be absolutely calm before starting out on something difficult," said Serpov, summarizing the results of that shift with the pilots. "But anxiety should not be a hindrance to the work."

This was typical of the flight commander. He frequently said to the pilots:

"If you want to surmount the moral-psychological barrier separating yesterday's student from a competent aerial warrior faster, remember that when you are at the airfield, you must think only about flying, only about things having to do with the forthcoming assignment."

Passing the examination for 3d class--this was the goal facing the young pilots of the flight in the year of the 26th CPSU Congress. No one in this friendly military collective ever suggests that there is always enough time, that something not done today could be put off until tomorrow. Here they try to get the maximum out of each flight shift, and to see that it would produce a substantial payoff in improving the pilot's combat skills and fulfilling the socialist pledges.

How can these objectives be reached? Captain Serpov has an arsenal of very effective forms of subordinate training and indoctrination that have been tested in practice. They include personal example, competent utilization of the achievements of competition leaders and active introduction of the best experience.

When for example Senior Lieutenant R. Khamidulin became a military pilot 2d class in a rather short time, Captain V. Serpov tried to make this a sort of standard for the other pilots to reach. He also recalled his own development and his service in a squadron of proficient combat pilots. He tries to remember what those experienced air warriors had taught him. Putting all of this together, he began using new and progressive ideas in the training and indoctrination of his subordinates.

Lieutenants of technical service M. Likholetov and N. Smalev achieved substantial results in service and in the socialist competition. Could the experience of their development not be utilized in work with young pilots? It could. There is nothing wrong with the fact that pilots and technicians work at the airfield, figuratively speaking, at different planes and in different dimensions. No matter what position a serviceman occupies, he is evaluated mainly according to his attitude toward his work and his official duties. Officers Likholetov and Smalev exhibit an organic combination of youthfulness, energy, technical competency and the required attention to detail in their work.

In Communist Serpov's opinion there is another side to the practice of referring to the personal example and experience of officer technicians: It engenders mutual respect and trust between flight crews and technicians, something without which success in combat training and maintenance of flight safety would be impossible. For example the flight commander always requires his pilots to accept their airplanes from the technicians in the way spelled out in the guidelines, without hurrying the ground specialists.

There are many good traditions in this outstanding flight. Perhaps the main one is firm friendship. The pilots, technicians and mechanics try to spend their leisure hours together, they do things together as families, and they participate in athletic competitions as a group. This also nurtures collectivism, it unifies the personnel, and it promotes attainment of high results in combat and political training. And the commander himself plays first fiddle in this.

Serpov does this work in close contact with the squadron commander and with his deputy for political affairs, Military Pilot 1st Class Captain M. Atroshchenko. The communist executives competently utilize the materials of the room of combat glory, and all valuable and progressive things offered by the regiment's contemporary life. Both are typified by initiative, an inquiring mind and purposefulness.

The fighter flew high in the sky, leaving a bright contrail behind--the pilot's signature. And it is a good thing that people such as Communist Captain V. Serpov, the commander of an outstanding flight, can be found among the ranks of the airmen, that they leave their mark in the service and combat training of their subordinates, preparing them for dependable protection of the motherland.

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AIR FORCES

FLIGHT TRAINING: TRAINER PROVIDES OBJECTIVE PILOT EVALUATION DATA

Moscow AVIATSIYA I KOSMONAVTIKA in Russian No 3, Mar 82 p 28

[Article by Lt Col Med Serv E. Kozlovskiy, candidate of medical sciences: "What the Training Exercises Showed"]

[Text] Lieutenant A. Ivanov is a tall, energetic man whose communicativeness makes him stand out from among his friends. He knew how to get a partner in conversation immediately interested in what he had to say, to tune him into himself in the first minutes. The grades given to Ivanov by his instructor in basic flight training were much higher than the ones earned by his peers.

The pilots passed the check-out flights and examinations allowing them to fly in the commander's seat, and they were to begin independent flying in the airplane. But first some work with the trainer was planned for them. During one of the sessions with the trainer they each flew three round-trip flights: in simple conditions, with the addition of a sensomotor task (work with a "Reserves" instrument) and actions in response to failure of one engine or disconnection of the course and glide system. After flying past the close-in homing radio station, the pilots went around for another pass, climbed to altitude and made a turn 90° in the direction opposite to that of the standard box pattern. At this time the instructor guided the airplane into the area of the fourth turn. Next the pilot himself performed the maneuver lining himself up with the runway.

Before the flight the order and particular features of the assignment were explained in detail to each person. During the flight they all oriented themselves in the situation well, and they made the correct decisions. Only A. Ivanov acted carelessly.

During the time the assignment was being explained he repeated again and again: "Everything's clear. I understand." The flight in simple conditions (the first in the program) he performed well, but after being diverted from his landing course he could not determine his position relative to the landing strip and come in for a landing. The exercise was explained to the pilot once again, but again he was unable to get his orientation--it was only after the fourth time that he was able to get on his glide path and land, though with difficulty.

Ivanov's failure in the trainer caused bewilderment. It was found out later on that the young pilot's piloting habits were unstable. While he was able to act efficiently on a standard, "well-worn" assignment, he made mistakes if the slightest

change was made in the program or if it was made more complex. In the air, the lieutenant was excessively aggressive, and his voice belied displeasure when he gave commands to the flight technician. After completing an exercise he remained in an excited state for a long period of time, and he tried to find various justifications for his mistakes when they were brought up by his instructor.

Data obtained following statistical treatment of indicators describing piloting quality, the level of physiological reactions and the attention reserves led to the conclusion that all pilots except Lieutenant Ivanov were ready to begin training as aircraft commanders.

It was found that whenever an assignment was made more complex, the quality of the lieutenant's piloting deteriorated the most in the group. In especially critical phases of flight his nervous and emotional tension was very high, and the quality of his piloting was unstable (his average scores varied from 3.2 to 4.2 points). His pulse was 15-30 beats greater per minute than the group average. His attention reserve was 1.5-3 times smaller than that of the other pilots, and it lay in the unsatisfactory range. Specialists concluded from the training exercises that A. Ivanov was emotionally unstable, that he loses self-control and makes gross errors in complex situations, and that his reliability in an emergency situation was low. In their opinion the lieutenant was not suited for training as a craft commander.

Which of the conclusions was the correct one--the instructor's, or the one based on objective testing data in the trainer?

The evaluation an instructor gives has been, and will apparently continue to be the decisive element in determining the professional and psychological readiness of a pilot for a combat training assignment. But it has been established that instructors can make mistakes in evaluating piloting quality in 20-30 percent of the time. This may explain the evaluation given to Lieutenant A. Ivanov by his instructor.

The basic nature of the flight training program and dangers of flight safety restrict the possibilities for significantly varying the flight assignments, and it is not easy for an instructor to reveal the way a student would act in a complex situation. The differences in the piloting techniques of all of the examined pilots were not significant. In summer, when much turbulence is encountered, the differences are even less noticeable. There are no possibilities for recording the intensity of physiological reactions in the air. In this connection an instructor scoring a flight is compelled to orient himself more on the outward behavioral reactions of the pilot. And sometimes it happens that an even-tempered character is mistaken for a passive character, while greater arousal connected with excessive nervous and emotional tension is mistaken for activeness.

Trainers outfitted with physiological monitoring apparatus make it possible to consider the nervous and emotional tension experienced by pilots when evaluating their training. Close contact of instructors with flight surgeons and physiologists makes it possible to arrive at a more probable prediction of the reactions of flight crews, to reveal nascent errors in time and to determine ways to prevent them.

But this is not exactly the way things are in many units. Only some standard exercises are sometimes included in the training program with the trainer. The instructor is not always present to monitor and control flights in the trainer: The pilots usually monitor each other. In a number of cases the flying is scored without regard to actual performance.

In one of the higher military aviation pilot schools, instructors having considerable flying and teaching experience and having done special instructor training are working with trainers under the guidance of Colonel (Reserve) S. Lyadov. They know the shortcomings and positive aspects of the apparatus well, they use the possibilities of the equipment competently, and they are conducting serious experimental research. Experience in cadet training has shown that trainer exercises provide a tangible impact when they are well organized, when they are conducted at a high methodological level, under strict control, and when the results are deeply analyzed. Effective methods of ground training accounting for the particular features of the unit's combat training activities have been developed in the school. This is helping to raise the quality of the flight skills of future military pilots.

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AIR FORCES

SUPPORT SERVICES: AIRFIELD MAINTENANCE DISCUSSED

Moscow AVIATSIYA I KOSMONAVTIKA in Russian No 3, Mar 82 p 35

[Article by Engr-Maj Gen Ye. Polezayev and Engr-Col V. Panchenko: "Taking Off At Any Time"]

[Text] Specialists of the airfield technical support unit and of the air engineer service perform their responsibilities with great diligence. Nevertheless sometimes they are to blame for breakdown of complex equipment: Compressor vanes and other parts of the engine intakes get damaged when foreign objects find their way into them. This happens primarily due to the lack of discipline of certain soldiers, their failure to comply with safety measures and a failure to consider various weather conditions when operating aircraft.

A survey of the drivers of an airfield operating company of the separate airfield technical maintenance battalion in which Senior Lieutenant I. Naumov serves showed that although most of them knew their responsibilities well and possessed good habits, not all of them clearly understood, for example, why a vehicle with a running engine must not be left standing on the landing strip for even a short time. The soldiers should know that this causes the concrete pavement to heat nonuniformly, resulting in the creation of cracks and chips. The resulting solid particles are sucked into the air intakes of a taxiing airplane, where they cause damage. Incidentally not all specialists of this company know how to prevent formation of ice chips on parking pads and taxiways either. Some drivers do not stick to the permitted routes of travel on the airfield, they violate taxiing procedures, and they run their vehicles off into the dirt, forgetting that small stones picked up by their tires could also get into air intakes and put an airplane's propulsion unit out of commission. Some technicians and mechanics leave foreign objects--bolts, safety wire and rags--in the air intakes of engines or near the inlets of propulsion units.

Questions concerning the skills and industriousness of personnel of the air engineer service are an object of constant discussion at party and Komsomol meetings, critiques and special lessons. Effective measures are implemented to ensure flight safety. The experience of the subunits commanded by Officer N. Kupchenkov deserves attention. Here the soldiers systematically study the rules of behavior at the airfield and of driving on it. They participate in discussions, conferences and advisory sessions on safety, and they make visual aids on the rules of taxiing airplanes to and from the parking pad. The teachers explain how and why objects on the surface of the airfield get into intakes. If particles are on a smooth surface,

the rush of air forces them to the side. Those in depressions, cracks and unfilled seams between concrete slabs, meanwhile, are quickly sucked up. They usually get into the air intake when the engines are tested at high RPM, when an airplane first starts moving as it taxis out for take-off, and at the beginning of the take-off run.

An entire complex of measures has been worked out to keep the landing strip and taxiways in good condition. The commanders constantly remind the personnel of this whenever they form up and when the day's tasks are announced to the incoming flight shift. In places where airplane propulsion units are started up and tested, soldiers carefully smooth out the surface of the pavement, and they coat circular areas 2 or 3 meters in diameter beneath the air intakes with enamel or oil paint.

The personnel of the airfield operating company have been instructed to maintain especially careful surveillance over the condition of seams between concrete slabs, located in the first 100-150 meters of the landing strip, and of seams on taxiways in areas where taxiing airplanes usually stop and turn--for example at the technical inspection point. When an airfield is prepared for flying, multiple unit water spray trucks pass over these places not less than two times, and sometimes more. After all airfield cleaning operations are completed, the soldiers walk the pavement in a line, picking up any particles on the landing strip that may have been missed. This method produces a good effect if the personnel act in strict compliance with the guidelines and according to schedule.

The commander and the staff officers constantly monitor the condition of the airfield, they seek and introduce new work methods, and they actively publicize the experience of the leaders of the socialist competition. The soldiers have set up inspection and washing stations at the airfield entrance points. The driver parks his vehicle on a trestle and washes the wheels and running gear with a hose. Specially prepared brushes and scrapers may be used if necessary.

Strict surveillance has been established over the condition of motor vehicles. A motor vehicle inspection post has been created for this purpose in direct proximity to the inspection and washing station. Moreover the regiment command and the staff officers always make sure that the pilots comply with the taxiing rules, and that they maintain their interval, distance and speed. These matters are discussed at flight critiques and during preliminary flight preparations.

These measures have made it possible to exclude gross violations in the work of the personnel and premature engine replacement due to personnel error. Having achieved their first successes in the new training year, the airmen are now competing for greater combat readiness and for an honorable welcome to the 60th anniversary of the USSR's formation.

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